



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/763,507	01/23/2004	Thomas Michael Sailer	0517.69179	7238

7590 09/18/2006

GREER, BURNS & CRAIN, LTD.  
Suite 2500  
300 South Wacker Drive  
Chicago, IL 60606

EXAMINER

CONTINO, PAUL F

ART UNIT PAPER NUMBER

2114

DATE MAILED: 09/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/763,507	<b>Applicant(s)</b> SAILER, THOMAS MICHAEL	
	<b>Examiner</b> Paul Contino	<b>Art Unit</b> 2114	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 23 January 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 and 15-27 is/are rejected.
- 7) ☐ Claim(s) 12-14 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION: Non-Final Rejection**

*Claim Rejections - 35 USC § 112*

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

1. Claims 7, 16, and 17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 7 recite the limitation "and/or" in line 3. This language makes claim 7 indefinite.

Claims 16 and 17 recite the limitation "said data receiver" in line 1. There are a plurality of "data receivers" in dependent claim 1. There is insufficient antecedent basis for this limitation in the claim.

2. Claims 1-27 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1, 24, 25, and 27 recite the limitation "partially redundant data items" in line 4 and "the redundant data items" thereafter. The term "partially redundant" is indefinite, and "the redundant data items" presents an antecedent basis problem. The Examiner recommends amending the claims by removing the term "partially". Claims 2-23 are rejected based upon

Art Unit: 2114

their dependency to rejected claim 1. Claim 26 is rejected based upon its dependency to rejected claim 25.

*Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-4, 16-18, and 24-26 are rejected under 35 U.S.C. 102(b) as being anticipated by Corney (U.S. Patent No. 4,532,630).

As in claim 1, Corney discloses an error tolerant computer controlled system comprising a plurality of redundant data sources generating at least partially redundant data items (*Figs. 1-3; column 1 lines 26-28 and 50-52, and column 3 lines 13-16, where sensors 1A-C are interpreted as redundant data sources*),

a plurality of data receivers for receiving the redundant data items and combining them to an error tolerant data item (*Figs. 1-3; column 1 lines 29-30 and 35-36, and column 3 lines 42-44, where it is interpreted that computing elements 29, 31, and 33 receive data items from the inputs and comparator 7 combines the data items*),

a switching assembly with a plurality of inputs and outputs, wherein each input is connected to one data source or to one output and wherein each output is connected to one input

Art Unit: 2114

or to one data receiver, and wherein each data receiver is connected via separate receiver communication links to at least two outputs (*Fig. 3; elements 11-27 are collectively interpreted as a switching assembly*),

wherein said switching assembly is adapted to connect any of said data sources to each of said data receivers over at least two different receiver communication links, and wherein said computer controlled system is adapted to send every data item from any given data source to any given data receiver through every one of the at least two different receiver communication links such that the given data receiver receives the same data item through at least two receiver communication links (*Fig. 3; column 3 lines 13-44*).

As in claim 2, Corney discloses each receiver communication link connects exactly one output to exactly one receiver (*Fig. 3; where each input to each SUM 29,31,33 is interpreted as having respective communication links to HPF 17,19,21 and EQ 23,25,27*).

As in claim 3, Corney discloses the number of receiver communication links for each data receiver is smaller than the number of data sources (*Fig. 3; where it is interpreted that there are three data source INPUTS 1A-C and two respective communication link inputs to each SUM 29,31,33*).

As in claim 4, Corney discloses the number of receiver communication links for each data receiver is 2 (*Fig. 3; where it is interpreted that there are three data source INPUTS 1A-C and two respective communication link inputs to each SUM 29,31,33*).

As in claim 16, Corney discloses said data receiver[s are] adapted to check a validity of each of the received data items and to use only those data items of a group of redundant data items that are valid (*Fig. 3; column 3 lines 37-44, where the summing of received data items is interpreted as checking validity, and it is interpreted that filtering and equalization previous to reception of data items by the data receivers validate the data items*).

As in claim 17, Corney discloses said data receiver[s are] adapted to determine a median or majority value of the valid data items of the group of redundant data items (*Figs. 1-3; column 1 lines 35-43 and column 3 lines 37-44, where summing/comparing is interpreted as determining a majority*).

As in claim 18, Corney discloses said data receivers comprise actuators (*column 4 lines 25-27; DERWENT TITLE [see included printout]*).

As in claim 24, Corney discloses an error tolerant computer controlled system comprising a plurality of redundant data sources generating at least partially redundant data items (*Figs. 1-3; column 1 lines 26-28 and 50-52, and column 3 lines 13-16, where sensors 1A-C are interpreted as redundant data sources*),

a plurality of data receivers for receiving the redundant data items and combining them to an error tolerant data item (*Figs. 1-3; column 1 lines 29-30 and 35-36, and column 3 lines 42-44,*

Art Unit: 2114

*where it is interpreted that computing elements 29, 31, and 33 receive data items from the inputs and comparator 7 combines the data items),*

a switching assembly with a plurality of inputs and outputs, wherein each input is connected to one data source or to one output and wherein each output is connected to one input or to one data receiver (*Fig. 3; elements 11-27 are collectively interpreted as a switching assembly*), and

a plurality of receiver communication links, wherein each data receiver is connected via separate receiver communication links to at least two outputs and wherein the number of receiver communication links for each data receiver is smaller than the number of data sources (*Fig. 3; where it is interpreted that there are three data source INPUTS 1A-C and two respective communication link inputs to each SUM 29,31,33*)

wherein said switching assembly is adapted to connect any of said data sources to each of said data receivers over at least two different receiver communication links, and wherein said computer controlled system is adapted to send every data item from any given data source to any given data receiver through every one of the at least two different receiver communication links such that the given data receiver receives the same data item through at least two receiver communication links (*Fig. 3; column 3 lines 13-44*).

As in claim 25, Corney discloses an error tolerant computer controlled system comprising a plurality of redundant data sources generating at least partially redundant data items (*Figs. 1-3; column 1 lines 26-28 and 50-52, and column 3 lines 13-16, where sensors 1A-C are interpreted as redundant data sources*),

a plurality of data receivers for receiving the redundant data items and combining them to an error tolerant data item (*Figs. 1-3; column 1 lines 29-30 and 35-36, and column 3 lines 42-44, where it is interpreted that computing elements 29, 31, and 33 receive data items from the inputs and comparator 7 combines the data items*),

a switching assembly comprising a plurality of switching units, each switching unit having a plurality of inputs and a plurality of outputs, wherein each input of each switching unit is either connected to one data source or via a switch communication link to one output of another switching unit, wherein each switching unit is connected via at least two switch communication links to other switching units (*Fig. 3; elements 11-27 are collectively interpreted as a switching assembly*),

wherein each switch communication link connects one output to one input, and wherein each data receiver is connected via receiver communication links to at least two different switching units, wherein said switching assembly is adapted to connect any of said data sources to each of said data receivers over at least two different receiver communication links, and wherein said computer controlled system is adapted to send every data item from any given data source to any given data receiver through every one of the at least two different receiver communication links such that the given data receiver receives the same data item through at least two receiver communication links (*Fig. 3; column 3 lines 13-44*).

As in claim 26, Corney discloses wherein, for each switching unit, each output can be connected to each input (*Fig. 3, where it is possible to connect each input to each output; where it is not necessary to connect each input to each output*).



\* \* \*

4. Claims 1, 5-9, 19, and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Emmert et al. (U.S. Patent No. 6,085,350).

As in claim 1, Emmert et al. discloses an error tolerant computer controlled system comprising

a plurality of redundant data sources generating at least partially redundant data items (*Fig. 1 #105; column 2 lines 58-59*),

a plurality of data receivers for receiving the redundant data items and combining them to an error tolerant data item (*Figs. 1 and 2; column 3 lines 24-41, where comparators 210 are interpreted as data receivers and the entirety of decision element 220 is interpreted as a combiner with output 130*),

a switching assembly with a plurality of inputs and outputs, wherein each input is connected to one data source or to one output and wherein each output is connected to one input or to one data receiver, and wherein each data receiver is connected via separate receiver communication links to at least two outputs (*Fig. 2 #300; where the collective voters 300 are interpreted as a switching assembly*),

wherein said switching assembly is adapted to connect any of said data sources to each of said data receivers over at least two different receiver communication links, and wherein said computer controlled system is adapted to send every data item from any given data source to any

Art Unit: 2114

given data receiver through every one of the at least two different receiver communication links such that the given data receiver receives the same data item through at least two receiver communication links (*Fig. 2 #s 120 and 315*).

As in claim 5, Emmert et al. discloses the switching assembly is divided into a plurality of switching units, wherein each input of each switching unit is either connected to one data source or via a switch communication link to one output of another switching unit, wherein each switching unit is connected via at least two switch communication links to other switching units, wherein each switch communication link connects one output to one input, and wherein each data receiver is connected via the receiver communication links to at least two different switching units (*Fig. 2; communication links 120*).

As in claim 6, Emmert et al. discloses wherein, for each switching unit, each output can be connected to each input (*Fig. 2; where it is possible to connect each input to each output; where it is not necessary to connect each input to each output*).

As in claim 7, Emmert et al. discloses exactly two switch communication links are attached to the inputs of each switching unit and/or wherein exactly two switch communication links are attached to the outputs of each switching unit (*Fig. 2; where links 315 split and are interpreted as two switch communication links*).

Art Unit: 2114

As in claim 8, Emmert et al. discloses the number of switching units corresponds to the number of data sources and wherein each switching unit is attributed to one data source, and wherein one input of each switching unit is connected to its attributed data source (*Figs. 1 and 2*).

As in claim 9, Emmert et al. discloses one output of the switching unit is connected to its attributed data source (*Figs. 1 and 2*).

As in claim 19, Emmert et al. discloses feedback links for transmitting data from said data receivers to said switching assembly (*Figs. 1 and 2 #125; column 2 lines 58-62*).

As in claim 21, Emmert et al. discloses an aircraft (*column 1 lines 18-21, where a space borne application implies an application to be used in an aircraft*).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Corney in view of Moore-McKee et al. (U.S. Patent No. 5,648,898).

As in claim 15, Corney teaches of data sources. However, Corney fails to teach of digital signatures or keys. Moore-McKee et al. teaches a unique key is attributed to each data source and each data source is adapted to generate a digital signature for each data item it sends using its unique key, and wherein the data receivers are adapted to check a validity of the signature upon receipt of a data item (*column 5 lines 58-60, column 8 lines 58-61, and column 9 lines 38-60, where the checksum is interpreted as a signature; it is implied that a key be used in order to create the checksum, that the checksum be included before sent from the data source, and that checksums are used to determine validity of a packet when received*).

It would have been obvious to a person skilled in the art at the time the invention was made to have included the digital signature/key as taught by Moore-McKee et al. in the invention of Corney. This would have been obvious because the invention of Moore-McKee is used in a vehicular system with sensors to increase fault tolerance (*column 5 lines 40-49*).

\* \* \*

6. Claims 20-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Corney in view of Cooper et al. (U.S. Patent No. 4,644,538).

As in claim 20, Corney teaches a vehicle. However, Corney fails to teach of drive and steering mechanisms. Cooper et al. teaches of data receivers controlling a drive and steering mechanism of the vehicle (*column 1 lines 5-23*).

It would have been obvious to a person skilled in the art at the time the invention was made to have included the mechanisms as taught by Cooper et al. in the invention of Corney. This would have been obvious because the invention of Cooper et al. offers a cost-effective solution to a fault-tolerant sensor system (*column 1 lines 56-59*).

As in claim 21, Corney teaches a vehicle. However, Corney fails to teach of an aircraft. Cooper et al. teaches of an aircraft (*column 1 lines 5-23*).

It would have been obvious to a person skilled in the art at the time the invention was made to have included the vehicle as taught by Cooper et al. in the invention of Corney. This would have been obvious because the invention of Cooper et al. offers a cost-effective solution to a fault-tolerant sensor system (*column 1 lines 56-59*).

As in claim 22, Cooper et al. teaches the comprises at least one pivotal drive unit for attitude control and for generating lift and forward thrust, and a drive control unit for controlling a tilt angle and a thrust of said drive unit, wherein said control unit is controlled by one of said data receivers (*column 1 lines 5-20*).

As in claim 23, Cooper et al. teaches said drive unit is driven by an electrical motor (*column 1 lines 43-47*).

\* \* \*

7. Claims 1, 10, 11, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Minto (U.S. Patent No. 5,357,425) in view of Pittelkow et al. (U.S. Patent No. 6,883,065).

As in claim 1, Minto teaches of an error tolerant computer controlled system comprising a plurality of redundant data sources generating at least partially redundant data items (*Fig. 3 #25a-n*),

a plurality of data receivers for receiving the redundant data items and combining them to an error tolerant data item (*Fig. 3 #22n and Fig. 2 #13*),

a switching assembly with a plurality of inputs and outputs, wherein each input is connected to one data source or to one output and wherein each output is connected to one input or to one data receiver, and wherein each data receiver is connected via separate receiver communication links to at least two outputs (*Fig. 3 #s 21,23,28,29*),

wherein said switching assembly is adapted to connect any of said data sources to each of said data receivers over at least two different receiver communication links (*Fig. 3 #23,28*), and wherein said computer controlled system is adapted to send every data item from any given data source to any given data receiver through every one of the at least two different receiver communication links such that the given data receiver receives the same data item through at least one receiver communication link (*Fig. 3*).

Art Unit: 2114

However, Minto fails to teach of redundant links to a receiver. Pittelkow et al. teaches of redundant links from a switch to a receiver (*Fig. 7 # 718; column 19 lines 7-9*).

It would have been obvious to a person skilled in the art at the time the invention was made to have included the redundant links as taught by Pittelkow et al. in the invention of Minto. This would have been obvious because inclusion of redundant links increases the fault tolerance of a system.

As in claim 10, Minto teaches repetitive time windows are attributed to each data source and wherein, in each time window, the switching assembly connects all receiver communication links to the data source attributed to the time window while disconnecting the remaining data sources from the receiver communication links (*Fig. 3; column 3 line 64 through column 4 line 24, and column 3 lines 60-63, where it is interpreted that a data source 25a is connected to all receivers 22a-n via switch 28 and cycled switches as depicted under clock 23 in Figure 3, during a time window  $T/n$ , with 25b being connected during the next time window, and so forth*).

As in claim 11, Minto teaches the switching assembly is divided into a plurality of switching units (*Fig. 3 #s 28,29,21,23; column 4 lines 23-24*), wherein each input of each switching unit is either connected to one data source or via a switch communication link to one output of another switching unit (*Fig. 3 #s 25a-n, lines 23-24, where it is interpreted that each switch 25a-n could be connected to a respective actuator 29*), wherein each switching unit is connected via at least two switch communication links to other switching units (*Fig. 3 switches under clock 23*), wherein each switch communication link connects one output to one input (*Fig.*

Art Unit: 2114

3, where the links are inherently connecting outputs to inputs), and wherein each data receiver is connected via the receiver communication links to at least two different switching units (*Fig. 3 #28, 29, and switches below clock 23*), and wherein, in each time window, the switching assembly is adapted to connect all switch communication links to the data source attributed to the time window while disconnecting the remaining data sources from the switch communication links (*Fig. 3; column 3 line 64 through column 4 line 24, and column 3 lines 60-63*).

Claim 27 is rejected in a similar manner as previously stated through the combined rejections of claims 1 and 10 by the applied prior art references Minto and Pittelkow et al.

#### *Allowable Subject Matter*

8. Claims 12-14 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

#### *Conclusion*

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul Contino whose telephone number is (571) 272-3657. The examiner can normally be reached on Monday-Friday 9:00 am - 6:00 pm.



Art Unit: 2114

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Scott Baderman can be reached on (571) 272-3644. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

PFC  
9/12/2006



**SCOTT BADERMAN**  
**SUPERVISORY PATENT EXAMINER**